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# Full Length Research Paper

# ENHANCEMENT OF THE DESIGNER PERFORMANCE IN BATHROOM INTERIOR DESIGN

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#### **Abstract**

The success of a good interior design is basically measured in line with its meeting the user requirements base defined at the preliminary stage. This is because the priority of users in interior design is "designing of the functional spaces that meet the needs thereof". As such, the aim of this study has been identified as examining the documents the interior designers utilize with an eye to determine the user requirements at the preliminary stage of interior architecture design and implementation and suggestion of necessary revisions for obtaining complete and accurate data with these documents. The scope of this study is limited only to bathroom interior design in order that detailed results can be achieved. The documents utilized to determine user requirements in bathroom interior design have been investigated as the methodology in line with the defined scope and purpose at the first stage. At the next stage, all data obtained from these documents have been examined by comparing systematically and the shortcomings have been revealed. At the last stage of the study suggestions to eliminate these shortcomings in question have been made.

**Keywords:** Bathroom interior design, user requirements, client questionnaire, interior design performance,

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#### **INTRODUCTION**

Interior design is the total creative solution for a programmed interior. It encompasses the conceptual planning, aesthetic and technical solutions applied to achieve the desired result. A "programmed interior" means a specific intended purpose or use of the built environment. Interior design concerns itself with more than just the visual or ambient enhancement of an interior space, it seeks to optimize and harmonize the uses to which the built environment will be put (ASID, 2015). Interior design and implementation process basically consists of five stages disregarding the size and scope of the project. These stages include the preliminary preparation, schematic design, design development, receipt of official approval subsequent to preparation of documents and implementing the application (Yazıcıoğlu,2012). The main objective(s) of the project is determined at the preliminary preparation which is the first and most important stage of the interior space design and implementation process; functional, dimensional contextual requirements listings are created for each space. Works to be performed are defined and planned before, after or in parallel with the works to be performed. A good interior design is possible only upon completion of the preliminary preparation stage in a healthy way.

Obtaining precise and accurate data at this stage minimizes the errors that may occur in the later stages and prevents loss of money and workforce (Temple, 2011; Yazıcıoğlu, 2012). Anthropometric sensory and cognitive dimensions of the users have to be defined at the preliminary stage in order that the works to be carried out as a priority (Arcan and Evci, 1992). This is because the humans provide size, scale and proportion to the environment with all the dimensions thereof. Knowing a human's physical and psychosocial dimensions ensures the identification of the user's expectations or in other words requirements as to the environment thereof. Comfortable spaces which are aesthetically designed with high value and according to the requirements of the users help to increase the life quality (Sally, 2005; Sensoy, 1984; Yazıcıoğlu, 2012). The success of interior design is basically measured in line with its meeting the user requirements base defined at the preliminary stage. Addi and Lytle (2000), express that the first priority of users in internal space design is designing of the functional spaces that meet the needs thereof. Therefore, they emphasize the need to be in cooperation with users to understand them in the design process (Addi and Lytle, 2000), Ching (2004) underlines in particular the need to take into consideration the users and their action needs to be able to understand the function of the interior space and meet the requirements related thereto in the best and most accurate way.

Arcan and Evci (1992) state that user is the measure of everything in the design process and combination of single actions arising from the user's needs which is the most important item to be taken into consideration constitute action areas and action areas come together and constitute usage areas. In this regard, they emphasize that interior design is realized by adjustment of action areas and the necessary equipments and fixtures with appropriate circulation areas. Stephenson and Stephenson (1960) also support this idea and state that the designer may have valuable ideas at the starting point but they have no importance if these ideas are not in agreement with user needs (Yazıcıoğlu and Kanoğlu, 2015).

#### **MATERIALS AND METHODS**

The aim of this study has been identified as examining the documents the interior designers utilize with an eye to determine the user requirements at the preliminary stage of interior architecture design and implementation and suggestion of necessary revisions for obtaining complete and accurate data with these documents. The scope of this study is limited only to bathroom interior design in order that detailed results can be achieved. The documents utilized to determine user requirements in bathroom interior design have been investigated as the methodology in line with the defined scope and purpose at the first stage. At the next stage, all data obtained from these documents have been examined by comparing systematically and the shortcomings have been revealed. At the last stage of the study suggestions to eliminate these shortcomings in question have been made.

# **Documents Used in Order to Determine user Requirements In Bathroom Interior Design**

As a result of research conducted in order to identify documents used in order to determine user requirements in bathroom interior design, it was found that these documents are questionnaire documents containing closed and open-ended questions (Client Questionnaire). CTA (2014) states that personal meetings made using the Client Questionnaire are very important to design process. Because client questionnaire translates the research objectives into specific questions that are asked of the respondents.

It standardizes those questions and the response categories so every participant responds to identical stimuli. By its wording, question flow, and appearance, it fosters cooperation and keeps respondents motivated throughout the interview. Questionnaires serve as permanent records of the research. They speed up the process of data analysis (e-bookspdf, 2014). Ayrıca (e-bookspdf, 2014; Burns and Bush, 2013) It is mentioned that use of "Client Questionnaire" furnishes the following additional benefits which help the progress the design process in a correct manner (Karaaslan and Yazicioglu, 2015):

- It translates the research objectives into specific questions that are asked of the respondents.
- It standardizes those questions and the response categories so every participant responds to identical stimuli.
- By its wording, question flow, and appearance, it fosters cooperation and keeps respondents motivated throughout the interview.
- Questionnaires serve as permanent records of the research.
- They speed up the process of data analysis.
- They contain the information upon which reliability assessments such as test-retest or equivalent-form questions may be made, and they are used in follow-up validation of respondents' participation in the survey.

27 different Client Questionnaires were obtained as a result of the researches carried out within the work to determine the user needs in the bathroom interior design (AK Complate Home Renovations, 2015; Bilathikulam, 2015; Churchville Kitchen and Home Design, 2015 Cowdin, 2015; Dutton, 2015; Design Salon Online, 2015; Elliott Oaks, 2015; EUTR, 2015; HGTV, 2015a; HGTV, 2015b; Heitzman Architects, 2015; Imagine That, 2015; MKC Kitchen and Bath Center, 2015; Mr. Paul's Custom Cabinets, 2015; Murray Arnott, 2015; HGTV, 2015a; Kitchen and Design, 2015; Kitchen by Julie, 2015; Kitchens Etc., 2015; Kitchens of Diablo, 2015; Preferred, 2015; So Cal Kitchen Visions-Kitchen and Bath Designer, 2015; Star Craft Custom Builders, 2015; Techline, 2015; Terrio, 2015; RIG, 2015; TMCC, 2015; HTRR, 2015). When the questions in these resources are evaluated quantitatively it was observed that they did not have a homogeneous distribution as seen in Figure 1.

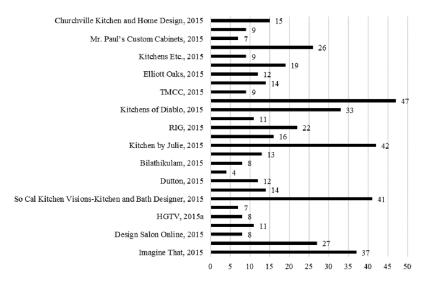


Figure 1. Numerical distribution of questions in sources

In other words, although the questionnaires are used for the same purpose, there are 4, 22 and 47 questions in the questionnaires of Heitzmann Architects (2015), RIGA (2015) and Star Craft Custom

Builders (2015) respectively.

A total of 487 questions were obtained in 27 different polls as can be seen in Figure 1 is as reaching. These 487 questions were examined in a comparative manner and the ones showing similarities were elected as shown in Table 1 and the number of questions was reduced to a total of 166.

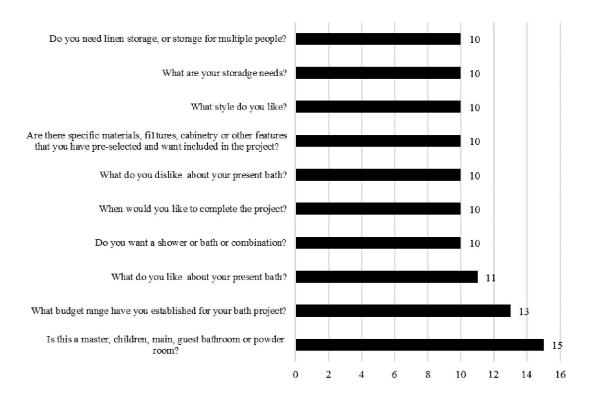


Figure 2. The frequency of use of first 10 most commonly used questions

Table 1. Questions to determine user requirements in the bathroom interior design

No	Questions
001	What type of project is this?
002	What are the primary reasons you want to remodel your bath?
003	What are the top three gripes about existing bathroom?
004	Have you ever renovated a bathroom before?
005	When would you like to start the project?
006	When would you like to complete the project?
007	Will you be living in the residence during construction?
008	Has anyone else assisted you in preparing a design for the bath?
009	Do you have a specific builder/contractor or other subcontractor with whom you would like to work?
010	What portion of the project, if any, will be your responsibility?
011	What budget range have you established for your bath project?
012	How long do you plan to live in the house?
013	What family members will share in the final decision-making process?
014	How many family members use this bathroom as their primary bathroom?
015	Who will be the primary user(s) of the bathroom
016	What are the heights of the primary users?
017	Is this bathroom for a house, condo or other?
018	Are sustainable design ideas important to your family?
019	Is this a master, children, main, guest bathroom or powder room?
020	How many bathrooms are currently in the home? How are they used and how often?
021	How many bathrooms do you need?
022	How many powder rooms do you have?
023	Do you have a master bathroom? How many people use it?
024	Should the master bedroom include a bathroom?
025	Is master suite bathroom located in master suite?
026	Is hall bathroom located on main bedroom level of home?
027	Powder room / hall bathroom located on what level of home?
028	Do any of the bedrooms need their own bathrooms? If so list those which do and type of fixtures desired in each?
029	How many family members may be in the bathroom at the same time?
030	Are you alone in the bathroom-is someone else in the household getting ready at the same time? If so, how do you interact in
	the space? Do you have enough privacy?
031	Who is the user of the bathroom?

- 032 How tall is the tallest/the shortest user of the bath?
- 033 Are you willing or looking to make structural changes?
- 034 When was the house built?
- 035 How long have you lived in this house?
- 036 How old is the present bath?
- 037 Are you considering relocating windows, doors or walls in your new plan?
- 038 Is there a view from the bathroom to be considered?
- 039 What is the characteristics of family members who will be using the new bathroom?
- 040 Do you anticipate: New children arriving? Children leaving the home? Parents coming to live with you?
- 041 Is children's bathroom located in children's bedroom?
- 042 Will more than one person be using the bathroom at the same time?
- 043 What types of bathroom activities can be done in a shared bathroom space?
- 044 What activities will be taking place in this bathroom?
- 045 What types of bathroom activities need to be done in private?
- 046 How important is auditory privacy?
- 047 How private should the bathroom be from the rest of the house and from the outof-doors?
- 048 Have you considered privacy zoning to allow several users to occupy the space at one time?
- 049 What do you dislike about your present bath?
- 050 What do you like about your present bath?
- 051 What features are you missing in your bathroom?
- How long have the problems with the space existed and what have you done to try to remedy the issues? What worked and what didn't?
- 053 Will this bathroom be used by visitors to the home?
- 054 Is guest bathroom located in guest bedroom?
- 055 Do any regular or frequent visitors have any physical limitation?
- 056 Does anyone have a physical limitation that may require structural accommodation? If so, please describe the limitation.
- 057 Will the visitors be children or adults?
- 058 Do you prefer separate showering and bathing areas?
- 059 Do you want a shower or bath or combination?
- 060 What kind of tub do you like?
- 061 What kind of shower do you like?
- 062 Would you like a tub that will accommodate more than one person?
- 063 Would you like a shower that will accommodate more than one person?
- 064 Will the there be a Jacuzzi or Spa? If so do you enjoy reading in the spa?
- 065 Does the shower need to be curbless for wheelchair access?
- 066 What water usage concerns do you have? For instance, do you often run out of hot water when filling the tub?
- 067 Is the water pressure adequate in current showers and tubs?
- 068 Is there enough hot water to meet our family's needs?
- 069 Will you have a heating zone in the baths or will you use toe kick heaters, heated floors, or heat/fan/light combo?
- 070 Will the shower also be used as a steam shower?
- 071 Do you want a bench in the shower?
- 072 Do you want a tiled shower or bath surround?
- 073 What material are you considering on shower walls?
- 074 Do you prefer the water closet and / or bidet to be separate from the other fixtures and placed in its own compartment?
- 075 What appliances do you plan on using in the bathroom?
- 076 Do you want an "appliance garage" for commonly used items such as hairdryers and curling irons?
- 077 What colors do you like?
- 078 What colors do you dislike?
- 079 What colors are you considering for you new bathroom?
- 080 What are the color preferences of other family members?
- 081 What will be the color of your fixtures (toilet, tub, sink)?
- 082 Are there specific materials, fixtures, cabinetry or other features that you have pre-selected and want included in the project?
- 083 What faucet finish do you have in mind?
- 084 What is the size of the bathroom?
- 085 Do you want a larger or smaller bathroom?
- 086 What type of vanity do you like?
- 087 Will there be a make up area or simply a vanity?
- 088 What should be the vanity size?
- 089 Do you want single or double bowl vanity?
- 090 Would you like a custom made vanity?
- 091 What style do you like?
- 092 Do you need extra countertop space?
- 093 Does the current bathroom have enough countertop area?
- 094 What kind of countertop materials are you interested in?
- 095 Do you have a preference for the height of your countertops?
- 096 Is your current bathroom storage adequate?
- 097 What are your storadge needs?
- 098 What features would help you keep your cabinet storage system well-organized?
- 099 Do you need linen storage, or storage for multiple people?
- 100 Outside a linen closet, do you want a lot of storage area for personal items?
- 101 Do you want centered sink or off to one side?
- 102 Are you looking for an undermount sink, drop in or vessel style sink?
- 103 How many sinks do you need?
- 104 What is your preferred sink style?
- 105 Do you want a backsplash?
- 106 Are there enough electrical outlets?
- 107 Are you looking for vanity mirrors or mirrored medicine cabinets?
- 108 Will this vanity area have a plate mirror, decorative or an articulated mirror?

- 109 What type of flooring material are you interested in?
- 110 What type of floor do you have now?
- 111 Are you going to keep your existing flooring?
- Do you want to tile the walls of the bathroom? If so, how high?
- 113 What are your wood preferences?
- 114 List any wood species or finishes you imagine in your bathroom?
- 115 Do you prefer laminates?
- 116 Do you prefer fiberglass tub/shower units or cast iron?
- 117 Are you interested in a toilet topper for extra storage?
- Does your bathroom require ventilation or an updated unit?
- 119 Does the bathroom currently have an exhaust fan?
- 120 What type of lighting do you want?
- 121 Do you need any additional electrical outlets?
- 122 Are the current electrical outlets protected with ground fault?
- 123 Would you like to have the flexibility of a hand held shower or any other particular fixtures?
- 124 What will the relation between cabinet and ceilling?
- 125 What type of cabinet do you like?
- 126 What cabinet door and drawer material do you prefer?
- 127 Is your bathroom's cabinet storage sufficient for your needs?
- 128 What kind of cabinet accessories do you like?
- 129 What special qualities (bright, roomy, double sinks) do you like in a bathroom?
- 130 Do you need a separate makeup area?
- 131 Should the toilet be in a separate space?
- How many people live the home? What are their ages?
- 133 Do you have separate half-bathrooms for guests (a powder room) and family (perhaps off a mudroom)?
- 134 Is there a powder room for guests only or does the family use it as an additional bathroom?
- 135 Do you plan to grow old in the space? If so, incorporating Aging-In Place design will be a consideration.
- Do you want a common toilet on the first floor of the house?
- 137 Do you want an exterior toilet?
- 138 Do you plan on having a servant? If so, does this person require a separate portion of the house for living?
- 139 What are your "must haves" for your new bathroom?
- 140 What safety features are you interested in?
- 141 What spot would be convenient for soaps and shampoos in your shower and/or tub area?
- 142 Would you like your towels stored in your bathroom?
- 143 Which items are necessary in your bathroom?
- 144 Is bathroom door accessible?
- 145 Is toilet accessible?
- 146 What is the type of toilet?
- 147 Can client transfer on/off of toilet independently?
- 148 Can client safely move in the bathroom independently?
- 149 Can client safely retrieve items from drawers independently?
- 150 Is the sink accessible?
- 151 What does the client use-stall shower tub and shower tub?
- 152 Can client safely step over ledge independently?
- 153 Are there grab bars present?
- 154 Can client safely manage the faucet independently?
- Do you have any pets?
- 156 Have you consider your need for skylights, windows, fans, and how they need to be controlled?
- Will audio- video or telecom be part of this master bath design? If so, let's consider speakers, video feeds, system controls, etc.
- 158 What is the primary time of day that the bathroom is used?
- 159 What existing fixtures will you be keeping?
- 160 Are you considering additional plumbing fixtures?
- 161 Would you be interested in a focal point in shower or a deco border?
- 162 Are there mold or mildew problems with your existing bath?
- How would you rate the overall condition of the bath to be remodeled?
- 164 If this is your only bathroom, what do you plan on doing while your current one is unusable?
- 165 Is this the only bathroom in your home?
- 166 Do you want his and her facilities?

When the distribution of questions utilized for determining user requirements in bathroom interior design listed in Table 1 were analyzed according to resources it was seen that they were like in Table 2. When the Table 2 was created some questions are split into multiple questions in order that they could be matched correctly and some of them were combined and converted to one question.

## Proposal for the Creation of Documents to Ensure Adequate and Correct Identification of User Requirements in Bathroom Interior Design

It is recommended to use all of the 166 different questions listed in Table 1 in bathroom interior design when creating new documents to ensure identification of user needs at an

adequate level and accurately (Yazıcıoğlu, 2015). However, if negotiations to be carried out with users will be performed in a limited period of time and if there is not enough time to ask all of the 166 different questions, priority should be given to 10 questions which are the most common ly met in terms of frequency of use according to resources (Figure 2). In this way questions in new documents should be divided into groups according to their importance level and a progressive structure should be established.

Anthropometric measurements and physical limits of the users are very important in interior design. In other words, a more functional interior design is possible only if it is ergonomic for the user thereof.

Therefore, questions should towards understanding the features of users when new physical documents are created. When the questions in Table 1derived from 27 different sources examined, it was observed that there were 7 questions related to this topic in Table 3.

When the distribution according to the source of the questions in Table 3 are examined it was seen that questions for understanding the physical properties of users were in 7 sources in total and some of these sources included a single question like "What are the heights of the primary users?"

Table 2. Distribution of the questions used to determine the user requirements by the sources

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Table 3. Questions to understand the physical features of the users

	Refe	erences	3								
What are the heights of the primary users? How tall is the tallest/the shortest user of the bath? What is the characteristics of family members who will be using the new bathroom? Do any regular or frequent visitors have any physical limitation?	X X Imagine That, 2015	X MKC Kitchen and Bath Center, 2015	X Design Salon Online, 2015	X HGTV, 2015a	X X So Cal Kitchen Visions-Kitchen and Bath Designer, 2015 X Cowdin, 2015	AK Complate Home Renovations, 2015	X X Kitchen by Julie, 2015	X RIG, 2015	X Kitchens of Diablo, 2015	Star Craft Custom Builders, 2015	X Churchville Kitchen and Home Design, 2015
Does anyone have a physical limitation that may require structural accommodation? If so, please describe the limitation.										X	X
Will the visitors be children or adults?  How many people live the home? What are their ages?				X	X	X	X	X		X	X

Table 4. Questions for defining user requirements in terms of color

	Refe	erences	3					
Questions	X Imagine That, 2015	Design Salon Online, 2015		XSo Cal Kitchen Visions-Kitchen and Bath Designer, 2015 XKitchen by Julie, 2015	115	X Kitchens of Diablo, 2015	Star Craft Custom Builders, 2015	2015
	Imagine	Design	HGTV, 2015b	X So Cal 2015 X Kitchen b	XRIG, 2015	Kitchen	Star Cra	EUTR, 2015
What colors do you like? What colors do you dislike?	X X		X	X X X	X X	X X		
What colors are you considering for you new	X	X	Λ	X	Λ	Λ	X	X
bathroom?								
What are the color preferences of other family	X			X				
members? What will be the color of your fixtures (toilet, tub, sink)?							X	

or "How tall is the tallest/the shortest user of the bath?" (Churchville Kitchen and Home Design, 2015; Kitchen by Julie, 2015). Questions to understand the physical properties of the users should be included in the new documents to be created and should be identified in a way to be answered by

taking into consideration the activities to be carried out in the bathroom and areas of activity (Yazıcıoğlu, 2012). In other words, which of the physical limits and anthropometric measurements of the users should be taken for which area of activity should be included in the documents.

- Main activity areas:
- Discharge,
- Cleaning,
- Washing,
- Secondary activity areas:
- Washing and drying clothes

Color is a significant design element that has the power to change the perception of space completely. The psychological effect of color changes the mental activities, physical performance, psychosocial situation of humans and plays important roles in the human-fixture-environment system. Very different effects can be created on users by changing the colors or even tones of a color in a space where everything is completely the same (Sağocak, 2005).

However, it is not right to have such an expectation for users. Therefore, the users should be required to make their style preferences through various visuals in the new documents to be created (Yazıcıoğlu, 2015).

#### **RESULTS**

It will be possible to create the documents to be used for determining the user requirements in bathroom interior design accurately and completely in line with all recommendations made within the scope of work.

Usage of these documents to be generated anew will improve designer performance in bathroom interior design significantly.

Table 5. Questions for defining user requirements in terms of style

	References								
Questions  What style do you like?  What is your preferred sink	X Imagine That, 2015	×MKC Kitchen and Bath Center, 2015	XHGTV, 2015b	X So Cal Kitchen Visions-Kitchen and Bath Designer, 2015 X Kitchen by Julie, 2015	X Kitchens of Diablo, 2015	X X Star Craft Custom Builders, 2015	X HTRR, 2015	X Preferred, 2015	X EUTR, 2015

Therefore, questions to identify user requests and their needs as to the color information , to receive clear and accurate answers must be able to receive clear and accurate answers. When the questions in Table 1 were examined it was seen that it included five questions from Table 4.

The answers of these five questions to be given by the users will be will be in the nature of the name and tone of the color such as light green or dark blue and etc. However, identifications intended by the users such as light green or dark blue has very low probability of being the same color tones corresponding to these names in the mind of the designer. An error to be made at this point can cause very undesired and adverse consequences in terms of user satisfaction (Karaaslan and Yazicioglu, 2015).

Therefore, the users must be provided with a color chart for making selection instead of saying the name of the color and tone in the new forms to be created. Similarly, when questions regarding the determination of the style are evaluated it was observed that the two questions in Table 5 were asked to understand this. The users have to have high command of design styles in interior design in order that they can give healthy answers to these questions.

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